Autonomous Snowplow Competition

ION North Star Section
Outreach Program

Autonomous Snowplow Committee

Preliminary Design Review
Presentation Information & Outline
2018 Competitors

November 2017

PDR Presentation Rules

- PDR presentation slides must follow the provided outline
  - Standardize judging for all Teams
  - *ASC Committee Hints*
    - *Match slide titles to the outline titles*
    - *Follow the given slide order*

- PDR presentation slides held in confidence throughout Competition
  - PDR slides will not be made public

- PDR presentation slides submission deadline: final version
  - 9 pm (Central Time); 2 November 2017 (Thursday)
  - Email submission to Vibhor and Suneel: vibhor.bageshwar@honeywell.com & sheikh@asterlabs.com
  - *Please submit a PDF version of the presentation to minimize file size*

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PDR Presentation Rules

- PDR presentation day: 4 November 2017 (Saturday)
  - Presentation medium: conference call and screen sharing
  - ASC Committee will call each Team 2 minutes before the PDR presentation time
  - Teams provide a call-in number by 2 November 2017
    - Email call-in number: vibhor.bageshwar@honeywell.com

- PDR presentation time: each Team is allotted 28 minutes
  - Teams provide their 1st, 2nd, and 3rd choices of time slots starting 30 October 2017 (please see slide 9)
    - Email time selections: vibhor.bageshwar@honeywell.com
    - ASC Committee will make every effort to assign Teams with their first choice
  - First PDR presentation begins on 4 November 2017 at 8:45 am (central)

Feedback to Teams will be provided by the Judges during the 28 minute PDR

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PDR Presentation Rules

- 28 minute presentation time breakdown
  - Student presentation: 16 minutes maximum
  - Q&A with Judges: 4 minutes maximum
  - Judges internal discussion: 2 minutes maximum
  - Team feedback: 6 minutes maximum

- Team scoring and reviews
  - Team scoring will be returned to Team contacts: 2 December 2017
  - Team scores will be updated on website in December 2017

- PDR Presentation Outline: ASC Committee Hints
  - Judge's scoring form follows the outline exactly
    - Slide titles should match outline titles
  - Address each section of the outline using at least one separate slide
    - Teams will not score points if sections of the given outline are not addressed
    - Example: presentations that do not address "Vehicle Design Challenges" will receive 0 points for that Section
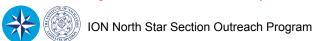
Use Figures and Tables to convey information to ASC Judges

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PDR Presentation Outline

Slide Title	Suggested Format**	Minimum # of Slides
Team Slide*		1
Objectives & Team Composition		1
Top-Level Requirements	Table	1
Plowing Strategy	Figure	1
Snowplow Vehicle Design	Figure	1
Navigation System Design	Figure	1
Guidance System Design	Figure	1
Processor & Software Design	Figure	1
Safety Systems	Figure	1
Failure Modes & Recovery Actions	Table	1
Overall Risk Assessment Summary	Table	1
Vehicle Design Challenges	Table	1

()*: Title slide;
()**: Include additional text outside figure/table as necessary

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PDR Presentation Outline

- Title Slide (1 slide)
  - Team university/name/logo

- Objectives (1 slide)
  - Team objectives
  - Team composition

- Top-Level Requirements (1 slide)
  - Hint: a requirement is a number that indicates when a design satisfies an objective
  - Hint: during the presentation, the Team doesn't need to go through every requirement; instead highlight the important requirements for the Judges

- Snowplow vehicle plowing strategy (minimum 1 slide)
  - Single "I"; Triple "I"
  - Hint: address vehicle strategy to plow snow, minimize plowing time, maximize snow removal, avoid obstacles, and return to garage

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PDR Presentation Outline

- Snowplow Vehicle Design (minimum 1 slide)
  - Snowplow vehicle and blade designs
    - Hint: include physical dimensions (size and weight)
    - Hint: consider the amount of snow that needs to be plowed at any time and consider the vehicle design required to plow (at least) that amount of snow
  - Sensor + processor component housing
    - Hint: address temperature control

- Navigation System Design (minimum 1 slide)
  - Concept and sensors
  - Navigation augmentation system
    - Location of navigation aids in competition field

- Guidance System Design (minimum 1 slide)
  - Way-point selection concept
    - Hint: describe how snowplow vehicle will generate its plowing path, avoid obstacles, and perform its functions

- Processor & Software design (minimum 1 slide)
  - Timing and action sequence flowchart

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PDR Presentation Outline

- Safety System (1 slide)
  - System description
  - Emergency shut-off options (physical and remote)
  - Stopping distance from maximum speed (identify surface)
  - *Figure: show how power is interrupted by emergency shut-off options*
- Failure Modes and Recovery Actions (1 slide)
  - Identify failure modes and recovery actions
    - Hint: consider operational problems and how the Team/vehicle would recover
- Overall Risk Assessment Summary (1 slide)
  - Evaluate major subsystems – identify the risk of subsystem issues on snowplow vehicle performance

- Vehicle Design Challenges (1 slide)
  - Highlight vehicle or system design changes from the existing designs
    - Indicate whether the vehicle or its systems are pre-existing or newly designed
  - Highlight the design challenges the Team will face adapting the vehicle and its systems to this year's Competition and weather conditions
    - Hint: first year Teams should identify major design decisions
    - Hint: returning Teams should highlight the design challenges the Team faced adapting the vehicle and its systems to this year's competition

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PDR Presentation Schedule

Morning PDR Session

Team	PDR Time (central)
	8:45 am
	9:15 am
	9:45 am
PDR Judges: 15 minute break	
	10:30 am
	11:00 am
	11:30 am

Afternoon PDR Session

Team	PDR Time (central)
	12:45 pm
	1:15 pm
	1:45 pm
PDR Judges: 15 minute break	
	2:30 pm
	3:00 pm

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PDR Presentation Scoring

- PDR presentation scoring: 10% of the total Competition score

Category	Scoring
Quality of Presentation Slides / Technical Presentation	80
Ability to Engage Audience	20
Total Points	100

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PDR Summary: Actions

Date	Actions
30 October 2017	1. Select 1st, 2nd, and 3rd PDR times (see slide 9) 2. Email time selections to Vibhor
2 November 2017	1. Email PDR call-in phone number to Vibhor 2. Call-in phone number: (local) number the PDR Judges should call to hear a Team's presentation
2 November 2017	Email Final versions of PDR to Vibhor and Suneel by 9 pm (Central Time)
4 November 2017	PDR!
2 December 2017	PDR scores sent to Team contacts
December 2017	Website updated with PDR scores

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